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TOMORROW'S READING INSTRUCTION--PARADOX AND PROMISE.

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THE PARADOXES AND PROMISES OF TOMORROWS READING INSTRUCTION ARE PROJECTED AND ANALYZED. CURRENT AND FUTURE DEVELOPMENTS IN THE AREAS OF TRANSPORTATION, COMMUNICATION, CHEMISTRY, PSYCHOLOGY, AND MEDICINE ARE DISCUSSED IN LIGHT OF THE IMPACT THESE INNOVATIONS WILL MAKE ON SOCIETY. THE CHANGES IN EDUCATION IN GENERAL AND IN THE TEACHING OF READING IN PARTICULAR WHICH MIGHT RESULT FROM THESE NEW DEVELOPMENTS ARE DISCUSSED AS THEY MIGHT AFFECT SCHOOL ARCHITECTURE, INSTRUCTIONAL ORGANIZATION, NEW METHODS AND MATERIALS, AND TEACHING READING TO DIFFERENT AGE GROUPS. LAST, THE IMPACT OF THE TREND TOWARD NATIONALIZED, FACTUALIZED, COMPUTERIZED INSTRUCTION IS EXPLORED IN A DISCUSSION OF THE PROS AND CONS OF NATIONAL TESTING, THE EFFECTS OF THE TECHNOLOGICAL REVOLUTION ON READING INSTRUCTION, THE INFLUENCE OF BIG BUSINESS ON EDUCATION, AND THE ROLE OF THE READING TEACHER IN A MACHINE-ORIENTED SOCIETY REFERENCES ARE GIVEN. (LS)

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#### **TOMORROW'S READING INSTRUCTION: PARADOX AND PROMISE**

This is an age of explosions. There is a knowledge explosion, a transportation explosion, a communication explosion, a chemical explosion, a psychological explosion, a medical explosion, and an educational explosion, of which reading instruction is one part. While trying to adjust ourselves to these explosions, other explosions will burst forth - all new and exciting.

Paradoxes usually accompany explosions. As explosions erupt, paradoxes often emerge as tenets contrary to existing opinions. Many paradoxes carry promise in placing before us different and better ways of thinking and behaving. Paradoxes also may carry dangers. Some new ideas at first sight appear to be true, desirable and glamorous. The test of time, however, often modifies one of

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these innovative paradoxes, or time may even relentlessly obliterate the new idea or concept.

In discussing "Tomorrow's Reading Instruction", I plan to point out some of the paradoxes of the future and to evaluate their promises and dangers.

In order to consider paradoxes of tomorrow, we must first visualize the world of tomorrow. The "tomorrow" that I have in mind is the year 1985. Children born in the present year of 1967 will be eighteen years old in 1985 and receiving their high school diplomas in June of that year. These are the children that we shall be teaching in the years ahead. In what kind of a world will they be living? What kind of reading instruction must we provide if these young people are to cope with changes that are racing by in super-sonic speed? Surely it will be paradoxical to what we are doing now.

First, let us discuss the kind of world in which these children will be ~~living~~ <sup>educated</sup>, then what kind of reading instruction we need to provide to them.

### THE WORLD OF TOMORROW

#### Transportation and Communication

Travel of all kinds will have undergone striking change by 1985. Man will not only have landed on the moon, but he will have established bases there. Because of man's ardent craving to explore new worlds, perhaps astronauts will have landed on Mars. Surely this will happen before the end of this century, and perhaps other planets

will have been visited, also.

Jet planes will flash through the air with supersonic speeds, taking us any place in the world in fantastically short times. Huge carriers many times bigger than the biggest plane at present will carry large groups of people to conventions like this one, or on excursions to different parts of the world. Helicopters will be commonly owned and used in carrying people to and from work. In cities the copters will land on rooftops.

Luxury trains will travel from coast to coast in a few hours. Some trains are under experimentation which travel 150 miles per hour. Undoubtedly these speeds will be greatly increased by 1985.

Automobiles will be streamlined, self-driving, and so heavily equipped with safety devices that it will be practically impossible for a person to get himself killed in an accident on the highway.

Telephones will be equipped with photographic devices, and we will be able to dial a person any place in the world.

Talking typewriters will take dictation, changing spoken words to printed symbols, and computers will take care of bookkeeping and recording in business offices. Storage of information will undergo phenomenal change. Even now the National Cash Register Company has perfected the art of microphotography to a point in which it is able to store on a single 4 x 6 inch film the entire contents of the Encyclopedia Britannica.

Satellites will flash educational programs, entertainment and

propaganda into far distant homes which now have little contact with the rest of the world. Satellites equipped with strong physical sensors will be able also to survey farms to detect diseases in crops. They may also be used to locate sources of minerals, drought areas and forest fires.

### Chemical and Psychological Developments

The chemical revolution of the present time may result in spectacular changes in learning with use of the new drugs. One of the most publicized drugs with which chemists are experimenting at present is their memory-enhancing pill. This drug is trade-named Cylert by the researchers who found it at Abbott Laboratories in North Chicago. <sup>Cylert</sup> ~~It~~ appears to produce a chemical found in the brain called ribonucleic acid, and so <sup>it</sup> is given the abbreviation RNA.

When N. Plotinkoff, a scientist in the Abbott laboratory,<sup>1</sup> tested the drug on rats, he discovered that it improved their learning capacity - up to five times the learning capacity of untreated rats. And this learning was permanent.

Now the memory pill is being tried in human beings. Results will not be available for some time, but hopes are high that the drug will do for humans what it did for rats.

Retarded children are likely to be given the memory pill under experimental conditions. If most retarded children are slow because of under-developed brain cells, the drug may offer some benefit to them.



Perhaps in this period of stepped-up effort by biochemists and biophysicists, control or modification of specific personality characteristics may become a possibility. And perhaps scientists may one day even reach into the genes and change the very stuff we're made of.

Environment, social contacts, and dendrites seem to have something to do with learning, also. The neurons appear to be the most likely candidates for the thinking process, but it is not known whether they reproduce. Dendrites which extend into the arms and legs do grow back after being severed or mangled. Therefore, scientists think that possibly neurons may send out new shoots, also, thus increasing learning ability.

Anyhow, there is some evidence linking dendritic growth with intelligence. Rats raised in enriched environments and in company with other rats were found more adept at learning tricks than their brothers and sisters raised in complete isolation. Dr. Krech and his co-workers at U. C. L. A. examined and compared the brains of these rats. They found a striking difference in the dendritic growth in the two groups of rats. The enriched environment, social group had much greater dendritic growth than the deprived rats and, as already stated, they were more adept at learning.

And so dendrites, RNA, and other memory drugs all fit into the picture. Nature seems to make use of all these elements in her own way. By 1985 scientists may have probed into nature and forced her

to reveal her secrets in ways which will raise intelligence and increase learning ability.

The possibility of using chemistry and psychology to improve learning is, indeed, a paradox of great significance.

### Medical Developments

Equally exciting will be the developments in medicine. No doubt the class of 1985 will have much longer lives than any preceding class. Chemical control of aging will take place. Resistance will be made possible in many kinds of disease, and unhealthy hearts, kidneys, livers and spleens will be replaced with healthy ones from other people, or it may be that synthetic organs or electronic devices may be used instead of natural organs.

All of this means, of course, that our population of older people will be greatly increased. Environment will change rapidly over their span of years, and it will be necessary for them to come back to school periodically to keep up with the changes, particularly in the areas of social studies and the sciences.

### Possibilities of Computers in Every Day Life

This may be an appropriate point at which to discuss the computer and some of its characteristics, and to indicate some of its possibilities in future years. The first commercial computer in the United States was installed just thirteen years ago. Now almost 20,000 are in use - in factories, banks, business offices, government - and 7,000 more are on order. Scientists are working on

models that will, it is predicted, develop their own intuition, design their own descendants, make their own decisions.

Some experts predict that eventually we will have high I. Q. computers. These computers will be able to comprehend I. Q. tests and make unbelievably high scores on them.

Possibly the most immediate and personal contact which you who are U. S. citizens will have with a computer will be a letter which you receive about your recently-filed income tax. Maybe you are saying "Thank goodness, that's over." But don't be too sure. A computer will snoop through the whole thing, and maybe decide that you should be called up for questioning. Heretofore, thousands of clerks have wearily poured over the figures of samplings of returns. This year clerks won't have this job. The returns will be scrutinized by a computer. If any of the characteristics of your report indicate that there is something wrong, the computer will type out a set of questions on a printer at 600 lines per minute. These questions will be sent to the tax collector in your district, who will call you in for interview. If you should be called for questioning, suppress the desire to swat some meticulous, round-shouldered, bespectacled clerk, because the computer, not he, will have been the monster who doubted your accuracy or veracity.

But to get on with the 1985 vision. It is said that individuals will not be handling money in the years ahead. Each person will have a computer number. He will give this number when he makes a deposit,



*and perhaps  
a thumb  
print*

and he will use the number in lieu of cash whenever he makes a purchase. The computer will keep a record of deposits and expenditures. It also will warn the person, himself, and the people with whom he is dealing when his deposits are reaching a dangerously low level in relation to his expenditures.

## SCHOOLS AND READING IN 1985

### School Architecture

In order that the flexible kind of education which we visualize for 1985 may proceed, we shall need new architectural arrangements in school buildings. In addition to building arrangements to facilitate new concepts of the learning process, provisions must be made for establishing sound mental health, life-long zest for learning, and aesthetic appreciations. Therefore, the school will need to be attractive in its setting and furnishings, comfortable as a place in which to live one's school life, and flexible in its space arrangements.

One of the boldest new plans being proposed in the United States is the educational park, which would assemble on a single large site children from a broad attendance area. In this park-like setting there would be clusters of schools; a high school which would accommodate several thousand students, intermediate schools for several thousands of middle-grade pupils, and perhaps only one primary school which would still serve as a neighborhood school. Students would be

taken to and from school by buses, or perhaps by helicopters.

An exhibit of school buildings was shown at a convention of the American Association of School Administrators in Atlantic City to indicate possibilities of the new park-like schools. The plans were not confined to possibilities in the United States. Among the exhibits, for example, there was a campus plan for grades 1-12 in Addis Ababa, Ethiopia.

One indication of the transition from old buildings to new ones in order to better meet the coming instructional programs is that they are "open-ended" - leaving opportunities for easy adaptations in the curriculum and instructional methods. Space is fluid, and flexible, sound-proof partitions can be moved to make large or small rooms as desired. Traditional classrooms will be replaced by instructional spaces designated as learning centers, seminar rooms, research areas, and learning laboratories. Air conditioning will be the rule. Large spaces will be broken into a series of operational units. Interiors will be broken by courts, lounges, snack bars, and general service areas. Drapes, interior glass panels, brick walls, murals, and varying color schemes will add softness to the interiors. Office space, lounges, and classrooms will be carpeted.

The study hall will disappear. It will be replaced with student carrels (small, enclosed structures for individual study), cubicles for computer work, seminar rooms, reading lounges, and more extensive library and research facilities.

Thus, the architecture of the new schools in communities that can afford them will be conducive to reading improvement. The provision for flexibility in room size will make it possible to organize small groups who have special needs in reading. Small rooms and carrels will permit some students to work individually and progress at their own rates. Better libraries, learning laboratories and ready lounges will permit independent study, research, opportunities to pursue solutions to problems, and the enjoyment of reading for pleasure and relaxation.

### Organizing for Instruction

The new grouping procedures present paradoxes. So many of these are appearing at the present time that it almost seems as if we are groping for grouping. This is quite paradoxical to our philosophy of the past.

Our first concern about grouping arose in the 1800's. The Westward movement, industrialism, more rapid transportation, the birth of new towns, and mounting hordes of youth - all of these factors together brought about public, tax-supported schools and mass instruction began. Organizing classes into grade levels was ushered in as the solution to our problems and McGuffey wrote the first series of graded readers to fit in with the school organization. Teachers, striving to meet individual differences, divided their classes into three groups each. The three-group plan has stood as an invincible bulwark ever since, but it will be gone by 1985.

Many new scheduling and grouping plans are already underway which stand as paradoxes to former arrangements. I will mention two of these. One is the flexible scheduling<sup>plan</sup>, which may serve as a harbinger of the future. This plan schedules the day into short modules of time. In Norridge, Illinois, they have 20-minute modules or 21 periods per day, instead of 7 as formerly. In the Indiana plan they have 15-minute modules.<sup>2</sup>

One short module may be used for something that doesn't require much time. Other modules may be connected to make longer periods as desired. Grouping varies, also.

Such flexibility in scheduling offers excellent possibilities for teaching reading. Perhaps a few students who want power reading might meet for fifteen minutes twice a week. Perhaps those needing corrective reading could meet fifteen minutes daily. Possibly remedial cases could meet with an instructor individually or in very small groups for thirty minutes daily, etc. I suspect that when all schools have more flexible schedules, the problem of trying to find a time in which to teach reading in the secondary school will no longer exist, and that such flexibility will also be a valuable aid in meeting individual differences in the elementary grades.

Along with flexible time scheduling, we find many new grouping plans emerging. One of these innovations is team teaching, in which<sup>3</sup> there are new groupings of both teachers and students. I suspect that some of you are already experimenting with team teaching. I

think this has great promise for tomorrow's teachers of reading.

One definition of team teaching is: "A type of instructional organization, involving teaching personnel and the students assigned to them, in which two or more teachers are given responsibility, working together, for all or a significant part of the instruction of the same group of students."

So, in team teaching the grouping of teachers is a major consideration.

A team of teachers may request a single student or as many as 350 students for lengths of time which vary from twenty minutes to a whole day. The team teachers decide on what activities will best meet the needs of their students for any particular day. They then plan on groupings and procedures in terms of these needs. Thus, the amount of time for reading and the elements of reading to be given practice are varied in terms of pupil requirements.

These examples of flexible scheduling and team teaching, I believe, are harbingers of future arrangements which hold much promise for successful teaching of reading to children of varied abilities.

### New Methods and Materials

The reading explosion of the sixties has been responsible for an outcropping of many new approaches to beginning reading. Authors and publishers hope that their respective products will enable



children to learn to read better and in a shorter time.

We have the Initial Teaching Alphabet, linguistic reading materials, programmed instruction, Words in Color, and several other new approaches. <sup>All these</sup> ~~These~~ are paradoxical to the use of a graded basal reading series which has been with us ever since the publication of McGuffey's set of readers. What about the future of these paradoxical methods and materials that are already with us? Some of them may be with us in 1985, but perhaps integrated within frameworks broader than word recognition, which most of them are primarily designed to teach. Others of them may remain much as they are and provided to teachers along with several other sets of material. Under these conditions, the teacher may choose from several methods those best suited to teach word recognition to children having different styles of learning. Some of our present paradoxical methods may disappear entirely and then come back in fifty or a hundred years wearing a different cloak of philosophy. I have found in my research that there are such things as historical cycles in reading. Some new approaches that we don't even dream of at the present time will have appeared by 1985, and will begin their cycles of modification, integration or obsolescence, as the case may be. Our knowledge of teaching reading will be richer, however, because of all of them.

As for promise, the fact that so many people are trying to find better ways of teaching reading is in itself promising. I hope that we may continue to search.

### Teaching Reading at Different Age Extremes

For the past four decades, children have entered first grade and started their reading instruction at six years of age. During the early twenties, their instruction in reading was supposed to have been concluded at the end of third grade. Later the endpoint came to be sixth grade, and eventually high school, and then on to college freshmen who needed to upgrade their reading skills. Now and then a few adults began coming to reading centers to improve their speed and comprehension. Now we have strong directives to teach adult illiterates to read, and this is now being done with vigor and the involvement of thousands of individuals. As a paradox of 1985, we may see the complete obliteration of illiteracy in our country, including all adults as well as children.

As for young children, the government, in its Head Start project, has already set the pattern for sending three and four-year olds to school. By 1985 all public schools will probably have nursery schools.

In some quarters pressure is now on by parents to teach their three and four-year olds to read, and some schools are teaching reading in kindergarten. Specialists in early childhood deplore this situation. On the other hand, children are more sophisticated today than they were when the six-year old readiness age was established in the 1920's. Studies and articles report that some children are reading early. We find accounts in popular literature as well.

You will probably recall that the author of the Pulitzer Prize winning novel To Kill a Mocking Bird, amusingly portrays the experiences of a pre-school reader. You will remember that Jem said of his four-and-a-half year old sister, ". . . Scout there's been readin' since she was born, and she ain't even been to school yet." Then, upon entrance in first grade, Scout, whose real name was Jean Louise, was asked to read something that Miss Caroline wrote on the chalkboard, and she read it so well that Miss Caroline was visibly vexed. Miss Caroline then had her read most of the first reader and stock market quotations in the Mobile Register. All of this time Miss Caroline's irritation was building up, and she finally exploded, "Tell your father to stop teaching you. It will interfere with your learning to read in school." Jean Louise said that her father didn't teach her and then she began soliloquizing to herself on how she did learn to read, and finally decided that it just came like learning to fasten the flap on the back of her union suit without looking around.

There are other children like Jean Louise, and they should not be denied reading if they want it. On the other hand, we must bear in mind that there are great masses of children in the United States who are not ready for reading, even at six years of age, perhaps not until seven or later. In these cases the school must catch up the lag.

Without a doubt, our concept of reading readiness needs

revision. In the meantime, let us hold fast to the assumption that there is no one chronological or mental age at which reading instruction should begin. Readiness for reading is a matter of individual qualifications.

By 1985, when all schools provide nursery schools, perhaps some children will be ready for reading earlier than otherwise would be the case. Simultaneously, by 1985 we shall have new tests for assessing reading readiness, new materials to use in strengthening certain readiness factors, and new administrative arrangements to take care of children who are immature in readiness constituents, and to foster their growth in aspects of child development needed for success in reading.

#### NATIONALIZED, FACTUALIZED, COMPUTERIZED INSTRUCTION

Without a doubt, our schools are becoming more nationalized, more factualized, and more computerized. As one example of these trends, "National Testing" will be discussed.

#### National Testing

As you undoubtedly know, a Carnegie-supported Exploratory Committee on preparing tests for national assessment was appointed. This committee requested specific organizations to produce specifications for instruments for each assessment. The Educational Testing Service and three other agencies were given contracts and have set up panels of specialists in each subject field. Although primary

attention is focused on the Carnegie-supported "Assessment of Educational Progress", efforts to set up national testing has the support and encouragement of the U. S. Office of Education.

Several educational organizations and individual leaders in education violently disapprove of such a measure. Some of their reasons are as follows:

1. Any national testing program will inevitably lead to a standardization of the curriculum.
2. Such a program will be used to compare one school with another.
3. The art of group testing is too poor to justify a national program.
4. It places great emphasis on only a part of the true objectives - the acquisition of knowledge and measurable skill, neglecting the important factors of total physical, social and emotional development, as well as personality growth and self-actualization.

Those who support the movement give such reasons as these:

1. At present we are without data to tell us where we as a nation stand in education, or how we compare with other nations.
2. In view of planning for education at local, state and national levels, we must have accurate information.
3. The government needs some uniform test data from the schools



of the nation so that they may judge properly the effectiveness of subsidies.

*So we see there are two sides to this matter.*

The baselines for the first major assessment are well underway, and it will be made this fall. <sup>4</sup>

1. Samplings will be taken of 9, 13, 17 and adult (about 30 years old) age levels. It is hoped that the school-age samples will be conducted through the schools; the adults will be reached by population sampling techniques.
2. Sampling will be at three levels--what 90% of the population should know, what the majority of the population should be expected to know, and what a small percentage (10%) should know.
3. The sampling also will be taken by four regions (Northeast, Southeast, Midwest, and Far West); by four levels of urbanization (city, rural, etc.), which also will take into account the socioeconomic level; and by both sexes.
4. The first measurements will be in nine areas--reading, writing, literature, vocational education, fine arts, social studies, math, citizenship, science.
5. No participant will be expected to take more than a small part of the battery, a maximum of 40 minutes. The full assessment would require about 10 hours.

The first assessment will be voluntary, given to schools whose administrators approve it. Henry Dyer of E. T. S. made a statement

at a recent testing conference in New York City to this effect:

The way to arrive at specific educational goals is through educational tests, "tests that measure the personal, emotional, and social outcomes of education, as well as the intellectual outcomes."

These are soothing words to those of us who are interested in aspects of child growth other than subject matter. However, insofar as my experience has prepared me to judge, it requires a psychologist to give subtle and deep probing tests to evaluate the "personal, emotional and social outcomes" of a child's education and to separate these developments from influences other than his education in school. I can't conceive of a valid assessment of such outcomes resulting from giving a 40-minute test, which also covers nine subjects.

This planned assessment will require from \$2 to \$3 million. Floyd N. Marriett, Vice-President of Carnegie, admits that some comparisons will be made, "and that there is some possibility of conformity to a national standard." Henry Dyer of E. T. S. says<sup>5</sup> that "teaching should be pointed very specifically at the tests the students will take as measures of output", and he believes that this is the only way to determine outcomes, which must be known before objectives can be set. So it is that the leaders involved in this project are still talking about comparison, conformity to a national standard, and the test results pointing toward our teaching goals. If the national tests are pointing toward teacher goals, then our

education is bound to become increasingly factual.

So, from what I can gather, I suspect that the reading teacher of tomorrow will have the results of his efforts tested by national tests. The most promising feature of this movement is that the poorer schools will probably get more financial aid from the government in order that they may produce better test results. I trust that each of us will hold fast and strengthen our personal ideals in regard to the development of physical, mental, linguistic, social and emotional growths.

#### Technology and Reading Instruction

*I shall*  
Now discuss the paradox that overshadows all others that I have mentioned so far - the technological revolution. Many people are predicting that all learning in the future will be administered by satellites and computers, and that books as we know them will become obsolete. We'll simply have microdots on computers.

Companies hoping to make a fortune in school hardware are buying up the publishers of school textbooks. RCA bought Random House; Litton Industries, Inc. bought American Book Company; Time, Inc. bought Silver Burdett and placed it in a joint venture with G. E.; Xerox bought American Education Publishers, together with their smaller subsidiaries; Raytheon bought D. C. Heath. Between 1964 and the end of 1966, 120 arrangements of this type were made, and they are still going on. Recently CBS bought Manhattan's venerable publishing

house of Holt, Rinehart and Winston, and Bell and Howell bought Charles Merrill.

Big Business is pushing the concept of technological revolution in schools with great vigor. Last August I listened to representatives of Ford Foundation, Carnegie, Western Union, and others as each presented to a committee of Congress his company's plan for an educational satellite program. Such a program would reach many people who are in need of education. It would, of course, also make a fortune for the company or organization that is permitted to develop it. Millions of receivers must be bought to make use of satellite programs, many new television sets must be purchased.

According to these plans, the costs of educational satellite programs are to be paid in one form or another by people exclusive of Big Business. One plan is to place a tax on television sets to support the program; another plan is to run a satellite commercial program concurrently with the educational program and use funds from the commercial program to finance the educational program. Another plan is to have the government finance the educational program out of taxes. Regardless of the plan, Big Business will make the profit and others will finance the program. *Many, however, may benefit from education provided in this way.*

As for computers: the computer enthusiasts say that practically all education in the future will be achieved through the use of programmed material served by computers as the student sits by himself in a carrel or cubicle. Much experimentation in teaching



reading with the use of computers is now underway in all elementary grades and high school.

The very latest experiment that I have heard about is the one underway in Brentwood School, East Palo Alto, California. IBM is the company that is financing this experiment. Here is a quotation about the experiment from Look magazine: "The IBM Corporation is especially happy since it has invested some \$30 million in the research and development of computer-based instruction. 'There may be a lot of profit in this one day,' says Leonard Muller, Director of Instructional Systems Development for IBM. Executives of other heavy-weight electronics corporations agree. They have begun to hear the rustle of the new money that is falling like autumn leaves onto educational ground."

Now to describe briefly how the children in this experiment are learning to read. The master computer that does the teaching has 18 terminals. As the children come to the classroom, each one sits down before a screen at the end of his terminal. Various pictures begin to dance on this screen in front of him. Soon he is asked by the computer to make a response. This he does with a light-projecting pen. If the response is correct, the computer says "Good!" If it is wrong, the computer says "Nooooo." If there is a hesitation of more than 5 to 10 seconds, the computer says decisively, "Do it now!" If the child still sits and does nothing at all, the computer taps out a distress signal calling the teacher. I suspect in such teaching



the teacher would be receiving such calls very often.

It seems that the government is aiding and encouraging the hastening of automated instructions. In the Saturday Review for January 14, 1966, there is a report of a sub-committee of Economic Development. This committee had as its charge to make recommendations in regard to "Efficiency and Innovations in Education." The committee was made up of 200, mostly business men.

To give you an idea of the tone of their recommendations, I will read you the opening paragraph of the report by the chairman of the committee.<sup>7</sup>

"Five centuries ago, when the first book was printed with movable type, the groundwork was laid for the greatest forward surge in education that the world has known up to now. Today we are seeing the beginning of another forward surge that may prove even greater. The electronic age is changing our traditional notions of education. The role of the teacher, the role of the classroom, the nature of the learning process, itself, must be re-examined in the light of the new technology." *The implication is that books are dead and will be replaced by technology.*

Several articles by other members of the committee follow, describing in glowing terms the use of different electronic devices.

I don't know why the committee on Economic Development should be telling us what the new directions in education should be, but they are. There are indications that Big Business is overstepping its bounds in trying to control education.

I don't believe, however, that we need to fear the future possibilities of this situation. I am confident that our leaders in Education, buttressed by the support of classroom teachers and college professors, will hold the front lines to a healthy balance.

I am pleased, already, at some of the responses that are coming forth from our professional leadership. The American Association of School Administrators, one of our most prestigious groups, held its annual convention in Atlantic City in February, 1967. Many of the speeches given by their members emphasized software as well as hardware. The January, 1967, issue of the Phi Delta Kappan devoted its entire contents to "Big Business, Technology and Education."

Fritz Janni, Research Chief in the Office of Education, expressed himself quite bluntly after attending a management convention. Among other things that were said at this convention in regard to the future of education was the remark of one executive who blurted out, "There's a billion dollar market at our feet." Another explained, "We've been in education for years. We train thousands of people every year, teach them to operate computers, build jet engines; we've got one machine with a tape recorder and color slides that show how to do industrial soldering in 35 steps."

Janni, being justifiably alarmed, exploded in effective, if not elegant, language, "Those guys who think you can teach kids in school just like you'd set up an industry program for 50 men in industrial soldering, they're nuts."

These are just a few examples of the expressed attitudes of some of our leadership people in regard to the aggressiveness of Big Business in our professional field. I think all of us should be aware of this situation.

There is no doubt at all but that we shall find many of the new electronic devices helpful. But I hope that we, as teachers, may always be able to choose which ones we want to use, how we want to use them, and with whom. These decisions I think must be left with us, irrevocably.

### The Role of the Reading Teacher

Some people are asking "Will the teachers of reading be needed in the future? Will teachers of reading have any role to play at all? <sup>Will teachers be dead?</sup> Will technology do the entire job of teaching reading? Will the teacher become a button-pushing robot?"

In my opinion, teachers of reading will be needed in the future, but they will have different roles to play. It is obvious, for one thing, that teachers should learn to be mechanics. They must understand computers and other technological devices thoroughly so that they may use them to advantage and possibly repair them when minor breakdowns occur. Teacher preparation colleges will need to give courses in computerization. In connection with such a course, or in a separate course, teachers should be taught how to prepare programmed material for use in the computer.

It is imperative, in my opinion, that teachers put their

creative talent to work in preparing materials for electronic devices. Computers are too expensive for schools to buy. So, those firms dealing in computers rent them to schools under the condition that the schools buy from them their programmed materials to use in the computer. And by whom are these materials prepared? By programmers, not by educators.

There is a heavy demand at the moment for programmers. Big Business needs 50,000 programmers at once. It is advertising for programmers and often saying that <sup>no special education</sup> ~~a college degree~~ or math is ~~not~~ required. I know a young man who had great difficulty in getting through high school. Because of his limited capacity, he went to work for a computer company, where he was to learn how to be a computer mechanic. Soon afterwards he told me that instead of working with mechanical aspects of computering, he was now programming material. I asked him what he was programming, and his reply was: "Anything they give me. All I have to do is to break it down into tiny bits and ask a lot of questions over and over again."

At the present time in our schools, we are using reading materials which have been prepared by authorities in the field of reading, educators who know children, who are well-acquainted in the broad, but specialized, field of reading. The computer people are making a big mistake in assuming that all that is needed in preparing reading material for the schools is someone who knows how to program. I am not alone in passing this judgment. Many others are saying the

same thing.

In a talk which was given by Harold Howe, U. S. Commissioner of Education, I heard him say, not in so many words, but to this effect:

I met with a bunch of business men lately. I told them that I thought we should have a new organization in Washington. We already have the Food and Drug Administration that watches over what we put in our bodies. I think, perhaps, we should have another organization to watch over what we put in our minds. This made some of them pretty nervous. This is what I wanted to do -- make them nervous.

Here is another quotation; this one is from H. Thomas James, Dean, School of Education, Stanford University:

"\$50 Billion to Spend"

The word seems to be going out to the schools that they are expected to buy \$50 billion worth of hardware in the next decade, and that they should get busy and figure out how they are going to use it. I have no doubt that \$50 billion worth of equipment would help improve education in this country; my plea is that we put the geniuses to work studying the education process, as some few of them are doing, and asking, not, "What can this piece of equipment I happen to have too much of do for education?" but, "Given present needs and opportunities in education, what kind of equipment might I invent that would be useful?"



Wanted: Bigger Storerooms

Unless the latter question gets attended to, we will have to build even larger storage rooms for unused hardware than we already have (and one has to see what we have to believe it!) or invent some new kind of disposal unit to grind it."

I don't know whether Big Business will ever take educators into partnership with them in preparing electronic devices and material to be used in them. I do know that teachers have much unused creative ability and ingenuity. If they will put their latent talent to work preparing materials, themselves, in terms of needs of their special groups or individual pupils, and then process these through the computer or other electronic device, I can see much more promise in the whole situation.

Don't you believe the shibboleth that computers are going to free you from drudgery and leave you free to do other things. This is a paradox in itself, for many of the people who are saying this are saying at the same time that computers have the possibilities of doing everything.

Let's consider for a moment what the computer can do in reading, and what you as teachers will need to do. The computer can drill children in recognizing whole words, in learning phonetic elements and perhaps in working with word structure. It can give a lot of practice in following directions. It can check literal comprehension with set answers.

But how about interpretation, critical reading and creative reading? In order to answer this question, I would like to take a moment to define the different kinds of comprehension as I see them. Literal comprehension is the skill of getting the primary, direct, "literal" meaning of a word, idea or sentence in context. Interpretation is used to include those skills necessary in getting deeper meanings than in literal comprehension, such as supplying or anticipating meanings not stated directly in text, drawing inferences, making generalizations, reasoning cause and effect, speculating on what will happen next, detecting the significance of a statement, passage or selection, and so on. Critical reading is the third level in the hierarchy of reading-for-meaning skills. According to my thinking, critical reading includes literal comprehension and interpretation, but it goes further than either of these in that the reader evaluates, passes personal judgment on the quality, the value, the accuracy and the truthfulness of what is read. Creative reading is different again. In the first three types of reading that I have mentioned, the student is working with the author's text and his thinking. In creative reading, the student leaves the author's text and branches out on his own in thinking through to different solutions to a problem or to sensing new relationships.

One of our most important objectives in reading is to teach students to think; hence, the emphasis on all of our teaching should be on the last three types of thinking, and I can't see how a

computer can develop these types of reading, for which there may be many answers. The computer may offer a child three answers from which he is to choose one. In this case, the child is confined to the three answers resulting from someone else's thinking, rather than doing his own thinking and coming up with his own unique answer.

Thinking, discriminating, decision-making individuals are what we need in future America. Our students can only develop in these ways through participation in group thinking where each one expresses his own thinking, checks others' thinking, and is checked by others, adds to others' thinking and lets others add to his - all of this guided by an astute teacher who will throw in a remark or question at the proper point to stimulate deeper reflection. Mental interaction is necessary in working with deeper meanings in reading, but arriving at one set answer <sup>usually</sup> ~~visually~~ is not a necessity. A variety of answers may come forth, but if straight thinking and sound judgment is shown, the variety that comes from uniqueness should be praised, not condemned. <sup>It</sup> Students have had practice in thinking rather than trying to find the one right answer set by someone; <sup>they have had a valuable experience.</sup> Computers or no computers, the teacher will have the major responsibility for teaching interpretation of reading content, the thinking processes attendant upon critical and creative reading.

Then what about the children for whom the computer taps out a distress call to the teacher? Certainly not all children are going to learn by computerized instruction or by T. V. programs administered

by satellites. There never will be any one panacea for teaching all children to read.

Perhaps while the majority are busy with the computer or other electronic devices the teacher can make case studies of those who are having difficulty in reading. She should be equipped during her college days to do a comprehensive case study of each child's qualifications for learning to read, as well as social and emotional factors which affect reading success. Perhaps numberless prospective remedial reading cases might have been prevented from developing if their teachers had made case studies of them at the outset of their trouble. We hope that teachers of the future may have time to make such studies, and that their colleges will have prepared them to do so and to correct the difficulties that are revealed, as well.

Psychotherapy has proved to be valuable also in working with remedial reading cases. Just being with someone who is sympathetic and encouraging aids the child in improving. Teachers should have more instruction in and more practice in using therapy during their college years. Warm, friendly, personal companionship is something that a computer or a satellite T. V. program cannot give. Teachers should be equipped to do more in the way of therapy. This is an area of teacher specialization which cannot be touched by automation.

There are other human influences of good teachers that cannot be duplicated by electronic devices. As <sup>Harry Brady</sup> ~~Henry Brandy~~ says:

" . . . it is hard to imagine a conversation between a machine



and a pupil; it is difficult to imagine the machine and the learner growing together, interacting with each other so that the experience of each changes irreversibly with each moment of instruction. It is even more difficult to conceive of a machine toward which the pupil feels respect and from which he expects understanding and respect. It is difficult to imagine how a machine could, without a word, pass a judgment on a pupil that the pupil will feel more keenly than the most detailed of reports from the battery of tests that the electronic counselors can emit on a second's notice."

We shall always need perceptive teachers of reading to guide and encourage students to invent questions as well as to answer them; to reflect, infer and predict; to string together beads of information in arriving at generalizations; to aid independence in study; to foster creativity; to nourish values; and to refine sensitivities. In my opinion, no automated device can ever take the place of a tolerant, understanding, dedicated, inspired teacher of reading.

One more point, "Are books dead?" This is a question which we as teachers of reading must face.

"The printed word is passing", say the technologists. Is this true? If not, what is the function of books in this automated world? Frank Jennings says:<sup>10</sup>

". . . the value of a book in the changing world is in its ability to hold things still long enough for them to be understood,



until fear and confusion can be replaced by something less paralyzing. The book can make yesterday's seven thousand years a golden tapestry for the hero's hall. With it we can measure today's dilemma against yesterday's defeats. It may not diminish the press of our anguish, nor tarnish the glow of our achievements, but it can show us connections, it can point out perspectives."

The function of books, both for adults and children, has been stated well in this quotation.

Insofar as children alone are concerned, never before have so many books been written for children, never have so many books been read by children.

As Jeane Dunn has so aptly said:<sup>12</sup>

"From the very tiny who point with petal fingers to intriguing details of illustration and inquire: 'What's dat?' to the young girl or lad with the just-perceptible mantle of adulthood resting on them, engrossed in the fifth dimension of A Wrinkle in Time, I have derived an uncrushable belief that Man's great gift to himself - the printed word - will never die."

I agree heartily with this sentiment.

Books are not dead! Teachers are not dead! God is not dead! God-given teachers of reading and interest-laden books will walk down the aisles of time together in happy communion so long as civilization may endure.

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